Indiana State Department of Health

Altered Standards of Care Guidance with an Emphasis on Pandemic Influenza

Draft Document for Review and Comment

Developed by the Altered Standards of Care
Community Advisory Group
Indiana State Department of Health

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Foreword

This document shall serve as a guide for hospital policymakers. All information contained herein is subject to change and applies only to patients 2 months of age and older.

Though adherence to these procedures and recommendations is not required by law, the adoption of consistent procedures and recommendations statewide would represent best practices during times of disaster and would assist in gaining public confidence. It is suggested that each hospital evaluate and apply this document in consideration of its unique needs including staffing, bed capacity, and community resources available to the hospital. Individual hospitals may then develop facility-specific policies and procedures.

Altered standards of care guidelines should be activated in the event of pandemic influenza or other public health emergencies declared by the Governor of the state of Indiana.

In the event of a declaration of disaster, the hospital should initiate previously developed procedures to authorize the emergency privileging and credentialing of health care practitioners and providers. Health care practitioners and providers may act outside their privileges as granted by the hospital based on prior education, training, or experience.

Background

The threat of pandemic influenza continues. Avian flu is well established, indeed endemic, in many areas of Asia, Europe, and Africa. Human cases contracted directly from diseased domestic poultry continue to occur on a regular basis in many countries. Some scientists believe that it is only a matter of time before an avian influenza virus mutates into a human pandemic virus. *A pandemic, by definition, means that the virus is new to humans (thus, no pre-existing immunity), is highly virulent, and spreads easily from human to human.* Therefore, treatment for an influenza pandemic will most likely be inadequate and will primarily involve supportive care measures. The virulence of a pandemic virus will cause serious illness or death in large numbers of people. When that happens, the medical community in Indiana, the United States, and the entire world will be overwhelmed with critically ill patients. A pandemic is likely to involve "waves" of illness lasting several weeks. Health care personnel will become patients, too. An increase in patient census and a decrease in available medical staff will necessitate changes in the provision of health care for everyone.

Due to the large influx of patients and the shortage of available health care staff and medical equipment, difficult decisions will need to be made regarding patient care and allocation of scarce resources. Hospitals will no longer be able to provide all things to all people. The guidance in this document will help Indiana hospitals make decisions in their efforts to be fair to everyone requesting medical treatment.

Triage

Initial triage will be vital. It is recommended that initial triage be performed outside hospital and health care facilities. For reasons of infection control, the first step will be to differentiate infectious from non-infectious patients in order to keep these two groups separate. People with possible pandemic influenza symptoms should be immediately separated from pregnant women and those with heart attacks, broken bones, lacerations, and other non-contagious diseases. However, during times of scarce resources, all patients, regardless of the nature of their illness/injury, will be evaluated using the same criteria. The second step will involve assignment of patients in each of the two initial triage categories to three groups based on their prognosis: Group 1) those who have the potential to benefit from scarce medical resources, Group 2) those who are unlikely to survive regardless of the treatment provided, and Group 3) those who are certain they are ill but display no physical symptoms. Patients in Group 2 should be referred for palliative care. Those in Group 3 should be referred for on-site counseling and reassurance.

Patients in Group 1 should be broken out into three more categories: 1) those requiring critical care, 2) those who can be sent home with instructions for supportive care, and 3) those who do not need critical care but have no one at home to care for them. (See Appendix 1)

Ethical Framework

In each group of infectious and non-infectious patients, there will be a subset of patients who will require assistance with breathing. In a severe pandemic, there are likely to be times when there is an insufficient quantity of appropriate medical equipment and qualified personnel. Thus, the need arises for another layer of triage. An ethical framework must serve as the starting point for a plan that proposes to allocate ventilators fairly. The following ethical framework was used by the New York State Department of Health in developing their ventilator allocation plan. Indiana has chosen to adopt the essence of the New York plan and incorporate the New York ethical framework.

Duty to Care
Duty to Steward Resources
Duty to Plan
Distributive Justice
Transparency

- *Duty to Care:* Patients must not be abandoned if they are not eligible for ventilator care. All possible palliative and supportive care must be provided for those who do not qualify for ventilator care.

- *Duty to Steward Resources:* Clinicians must balance the obligation to save the greatest possible number of lives against the obligation to care for each single patient. Decisions on the use of scarce resources must be heavily weighed against the chances for survival.

- *Duty to Plan:* To prevent exhausted and over-taxed frontline providers from having to make difficult on-the-spot decisions, guidelines must be established in advance of their need. The failure to do so would be a failure of responsibility toward both patients and providers. Any plan cannot be presumed to resolve inequities in pre-existing health status resulting from unequal access.

- *Distributive Justice:* A just system of allocation must be applied broadly in order to be fair. **The same allocation system should be in use across the state, and the decision to implement rationing must be authorized by the state.** Ethically sound responses to disaster must not exacerbate disparities in access to care. Rather, planners must designate appropriate resources for the most vulnerable who are most likely to suffer the greatest impact in any disaster.

- *Transparency:* Broad input in the design of the triage system is necessary. Indiana has worked with a wide variety of health care professionals and received input from the general public in review of the guidance.

Pre-triage Requirements

Before implementing altered standards of care, "engineering controls" need to take place in hospitals. The use of all other possibilities for managing the surge of patients must be exhausted first.

- Elective procedures that might result in the use of a ventilator should be postponed.
- All available means of "surge capacity" must be created:
  - Plan for staff shortages;
  - Stockpile personal protective equipment;
  - Purchase additional ventilators (if possible); and
  - Share resource information statewide.

Patient Categories for Triage

A just rationing system must be applied to all hospitalized patients, not solely to those with influenza. Access to ventilators will depend on clinical factors only. *Age, social worth, and job function will not affect triage allocation decisions.*

Implications of Triage for Facilities

Statewide policies are crucial to assuring equity throughout Indiana. Equitable rationing systems, particularly ones that contemplate limiting access to life-saving treatment, must assure that the same resources are available and in use at similarly situated facilities.

Patients using ventilators at home and in chronic care facilities will not be subjected to the acute care triage guidelines at their residence. Chronic care

facilities will have to provide more intensive care on site as part of the general process of expanding care beyond standard locations. Barriers to transfer are appropriate and likely during a phase in which acute care hospitals are overwhelmed. If, however, chronic care facility patients require transfer to an acute care facility, they will be assessed by the same criteria as all other patients and might fail to meet criteria for continued care in the hospital.

Pediatric Patients

For the purpose of treatment options during an influenza pandemic, persons aged 13 years and older will be considered adults. Pediatric patients will be evaluated using the same criteria as adults with some minor adjustments:

- Children aged less than 10 years: Blood pressure will be calculated using the criteria of normal being ≥70 + (2 X the age in years).
- Children aged 10 years and older: Blood pressure will be calculated using adult values.
- Children aged 10 to 16 years: Either system can be used for bed allocation decisions.

In deference to the pediatric population and patients who may be medically sedated, Glasgow Coma Scores will not be calculated at 48 and 120 hours if it is necessary to awaken the patient to do so unless that calculation might place the patient in another Sequential Organ Failure Assessment (SOFA) category. Additional chronic diseases have been added to the Pandemic Influenza Triage Criteria (Appendix 4) to reflect the inclusion of the pediatric patient.

Due to the scarcity of pediatric intensive care units in Indiana, it may be necessary to explore out-of-state hospitalization for some pediatric cases. The process for making this decision is outlined in Appendix 7.

Clinical Evaluation

A clinical evaluation system based on the SOFA score and the Ontario Health Plan for an Influenza Pandemic (OHPIP) protocol has been adapted for use in this guidance. (See Appendices 2 and 3) Patients on ventilators in hospitals when altered standards of care begin will also be assessed to determine whether they meet criteria for continued use. Candidates for extubation during a pandemic will include patients with the highest probability of mortality. The proposed system attempts to prioritize triage decisions regarding patients initially requiring ventilators over increasing the number of ventilators through withdrawal of ventilators from those patients who are currently mechanically ventilated.

EMS personnel might not have sufficient data to apply allocation criteria in the field and, therefore, will not be asked to do so. Emergency department staff may reassess patients upon arrival and extubate as necessary those patients who do not meet criteria for critical care admission and ventilator use.

After the initial evaluation, ongoing assessments of patients will continue using the Critical Care Triage Tool. Patient status will be reviewed and reassessed at intervals of 48 and 120 hours. Patients who continue to meet criteria for benefit or improvement will continue until the next assessment, while those who no longer meet these criteria will lose access to mechanical ventilation. (See Appendix 3)

Exclusion criteria should focus primarily on current organ function, rather than on specific disease entities. If any one of the exclusion criteria is present upon initial evaluation of the patient, the patient will be referred for supportive and/or palliative care and will not be considered a candidate for ventilator support.

Exclusion Criteria for Ventilator Access*

- Cardiac arrest: unwitnessed arrest, recurrent arrest, arrest unresponsive to standard measures; trauma-related arrest
- Incurable malignancy with poor prognosis
- Severe burn: body surface area >40%, severe inhalation injury
- End-stage organ failure:
  - Cardiac: NY Heart Association Class III or IV
  - Pulmonary: severe chronic lung disease with FEV_{1}** <25%
  - Hepatic: MELD*** score >20
  - Renal: dialysis dependent
  - Neurologic: severe, irreversible neurologic event or condition with high expected mortality
  - Patient or patient's designee declines ventilator

*Adapted from OHPIP guidelines
**Forced Expiratory Volume in 1 second, a measure of lung function
***Model of End-stage Liver Disease

Bedside clinicians treating patients will not be responsible for allocating ventilators to individual patients. Clinicians directly caring for the patient will assess the patient's condition and note the emergence of any exclusion criteria. A triage review officer, the supervising clinician in charge of critical care patients (either in the unit or in its overflow areas), will make triage decisions based on the allocation protocol. The triage officer will be a supervising clinician with better access to

information on the number and nature of patients awaiting admission to the unit and can set triage goals according to system-wide criteria.

Implementing SOFA Scores

1. A SOFA score should be calculated every day for all patients requiring access to inpatient resources with each patient classified into red (highest priority), yellow (intermediate priority), and blue or green (low priority) for remaining in the ICU. Clearly document the time of every SOFA calculation.
2. If a patient's status is green, the patient should be transferred out of the ICU.
3. If a patient's status is blue based on the presence of "exclusion criteria" at any time during the hospital stay, the patient should be transferred out of the ICU. A *Do Not Resuscitate* order (DNR) should be written and appropriate palliative and supportive care provided.
4. In the absence of "exclusion criteria," decisions to institute or continue invasive or non-invasive ventilator support should be made at initial triage, then at 48 hours, 120 hours, and daily thereafter. This allows patients the opportunity to improve and continue to receive ventilator support during the first 5 days.
5. The daily SOFA assessment after 5 days (120 hours) should use the 120-hour criteria.
6. If decisions must be made to remove patients from a ventilator to provide resources for new patients, the following guidelines are suggested:
    a. A patient classified as yellow (intermediate priority) who needs admission *cannot* have priority over a patient classified as yellow or red (high priority) who is already in the ICU.
    b. A patient classified as red who needs admission *cannot* have priority over a patient classified as red who is already in the ICU.
    c. A patient classified as red who needs admission *cannot* have priority over a patient classified as yellow during the first 5 days (120 hours) of the patient classified as yellow's stay in the ICU.
    d. A patient classified as red who needs admission *can* have priority over a patient classified as yellow after the patient classified as yellow has been in the ICU for 5 days (120 hours).

Palliative Care

Clinicians will be faced with the need for palliative care and end-of-life care for patients in ICU or on ventilators who fail to meet rationing standards for continued support. Clinicians should clearly document the rationale and decision regarding extubation with sedation. Care must focus on decreasing pain and suffering by providing treatment for relief of symptoms along with comfort and support which can include nasal cannula oxygen, if available, or other supplements to breathing.

The goals of palliative treatment are: relief from suffering, treatment of pain and other distressing symptoms; psychological and spiritual care; and a support system to help the individual, the individual's family, and clinicians.

As part of the altered standards of care, providers should establish an end-of-life team that involves the treating doctor and other health care professionals and social services. If a provider does not have an end-of-life/palliative care program, community resources, e.g., hospice providers, should be included in the provider's altered standards of care plan.

Method for Resolving Identical Scores

At any time should the calculation of SOFA scores result in more than one person in the same category (red or yellow) and not enough resources for all, a means of breaking the tie may be necessary. The time of the initial SOFA calculation shall be documented on all patients. *In the event of a tie leading to more than one patient needing mechanical ventilation in the setting of a scarcity of mechanical ventilators, the person(s) with the earliest documented time of calculation of the SOFA shall be treated first.* This is consistent with the principle of first come, first served.

Daily Review of Decisions

The proposed system for triaging ventilators, based on the recommendations of the New York State Working Group, as modified by the Indiana State Department of Health and adapted for use in the state of Indiana, is based on a careful assessment of likely pandemic scenarios, principles of scarce resource allocation, and careful ethical consideration.

It is crucial that review of the outcomes of allocation decisions be undertaken insofar as resources and personnel will allow during a crisis. The outcomes of allocation decisions should be examined on a daily basis. This effort should focus

on whether: 1) trends seen in allocation decisions might inform allocation decisions in future ways from an operational point of view, and 2) whether triage decisions made in the context of the ventilator triage framework led to decisions which are systematically and/or ethically problematic. If ethical concerns are identified in the course of such a review, they can be used as the basis for changes to the overall allocation algorithm midstream. Thus, this review process provides a means of adaptation for the system at large.

The scarcity of resources and personnel may make careful record keeping and retrospective review difficult or impossible. While meticulous record keeping is desirable, in such cases, it is ethically important to prioritize energies spent in the direct saving of lives over those spent keeping records and in post-hoc analyses.

Additional Altered Standards

In addition to making decisions about patient care, altered standards also refer to the use of supplies and equipment. They may be rationed and used in ways consistent with achieving the ultimate goal of saving the most lives. Health care facilities will need to implement the re-use procedures already developed and approved by their medical boards.

Providers may need to make treatment decisions based on clinical judgment if laboratory resources or radiology resources are exhausted. Treatment decisions then will be made based on physical exam, history, and clinical judgment.

Suggested Documentation

Appendices 4, 5, 6, and 7 provide additional guidance for patient documentation during the use of altered standards of care.

Appendix 4 provides guidance for staff at off-site locations for initial triage of patients who need further evaluation for possible hospital admission. These criteria can also be used for patients who first present at hospitals.

Appendix 5 is a flow chart that can be prominently posted so seriously ill patients can be easily monitored for changes in condition. By reviewing these flow charts, the SOFA officer of the day can quickly and easily note if patients are improving or deteriorating. The chart will also make the daily review of decisions easier to accomplish.

Appendix 6 provides a suggested list of admission orders for patients with possible pandemic influenza. In a time of increased patient census and decreased staffing, it helps to make admission orders standard and consistent so that they can be quickly and easily implemented.

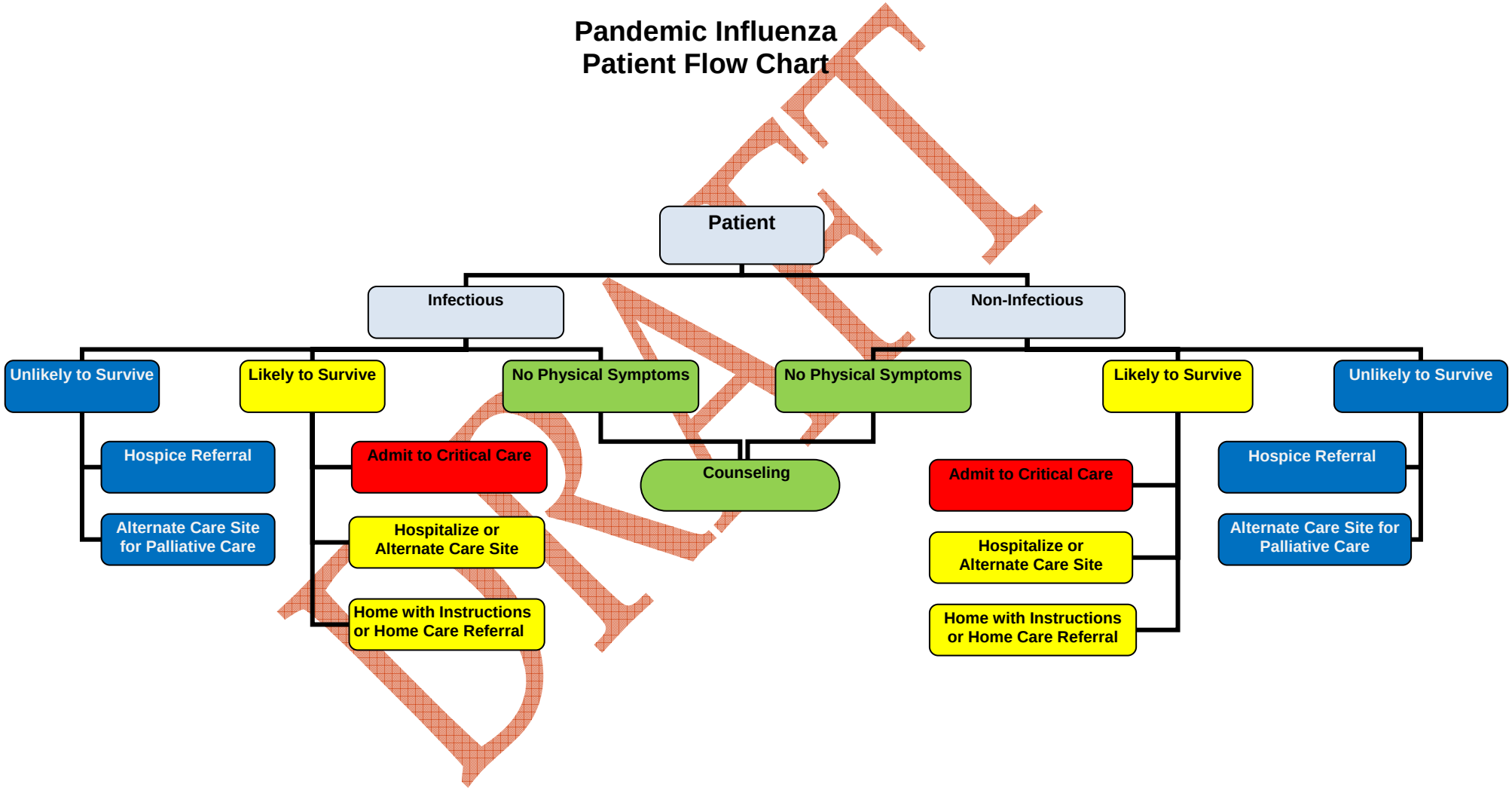
Appendix 7 offers direction about securing available beds for critically ill children.

Appendix 8 provides guidelines for consideration of non-invasive ventilatory support during an influenza pandemic. When planning for a pandemic, many health care organizations are taking inventory of their existing respiratory equipment and making strategic decisions on whether investment in more equipment is warranted. Recognizing that fully equipped mechanical ventilators are expensive and may stretch the financial resources available to institutions, health care organizations may wish to consider alternative modes of effective ventilator support, recognizing the caveats outlined in the appendix.

Communication about Altered Standards of Care

Public education about the need for and the process of handling ventilator support issues must be carried out early and often, prior to and during the pandemic. Patients and families must be informed immediately that ventilator support represents a trial of therapy that may not improve the patient's condition sufficiently, and that the ventilator will be removed if this approach does not enable the patient to meet specific criteria.

Appendix 1


Pandemic Influenza
Patient Flow Chart
Patient
Infectious
Non-Infectious
Unlikely to Survive
Likely to Survive
No Physical Symptoms
No Physical Symptoms
Likely to Survive
Unlikely to Survive
Hospice Referral
Alternate Care Site for Palliative Care
Admit to Critical Care
Hospitalize or Alternate Care Site
Home with Instructions or Home Care Referral
Counseling
Admit to Critical Care
Hospitalize or Alternate Care Site
Home with Instructions or Home Care Referral
Hospice Referral
Alternate Care Site for Palliative Care
DRAFT

Appendix 2

Sequential Organ Failure Assessment (SOFA) Score

SOFA Scale

Variable	0	1	2	3	4
PaO2/FiO2 mmHg	>400	≤400	≤300	≤200	≤100
Platelets, x 10^3/µL (x 10^6/L)	>150 (>150)	≤150 (≤150)	≤100 (≤100)	≤50 (≤50)	≤20 (≤20)
Bilirubin, mg/dL (µmol/L)	<1.2 (<20)	1.2-1.9 (20-32)	2.0-5.9 (33-100)	6.0-11.9 (101-203)	>12 (>203)
Hypotension	Adults: None Children: >70 + (2 X age in years)	Adults: MABP <70 mmHg Children: <70 + (2 X age in years)	Dop ≤5	Dop >5, Epi ≤0.1, Norepi ≤0.1	Dop >15, Epi >0.1, Norepi >0.1
Glasgow Coma Score*	15	13-14	10-12	6-9	<6
Creatinine, mg/dL (µmol/L)	<1.2 (<106)	1.2-1.9 (106-168)	2.0-3.4 (169-300)	3.5-4.9 (301-433)	>5 (>434)

Dopamine [Dop], epinephrine [Epi], norepinephrine [Norepi] doses in ug/kg/min
SI units in brackets

*Glasgow Coma Scores will not be calculated at 48 and 120 hours if the patient must be awakened to do so unless the score could move the patient into another category.

Adapted from:
Ferreira FI, Bota DP, Bross A, Melot C, Vincent JL. Serial evaluation of the SOFA score to predict outcome in critically ill patients. JAMA 2001; 286(14): 1754-1758.

Explanation of variables:
PaO2/FiO2 indicates the level of oxygen in the patient's blood.
Platelets are a critical component of blood clotting.
Bilirubin is measured by a blood test and indicates liver function.
Hypotension indicates low blood pressure; scores of 2, 3, and 4 indicate that blood pressure must be maintained by the use of powerful medications that require ICU monitoring, including dopamine, epinephrine, and norepinephrine.
The Glasgow Coma Score is a standardized measure that indicates neurologic function; low score indicates poorer function.
Creatinine is measured by a blood test and indicates kidney function.

Appendix 3

Adapted Ontario Health Plan for an Influenza Pandemic (OHPIP) Triage Tool

Critical Care Triage Tool (Initial Assessment)		
Color Code	Criteria	Priority/Action
Blue	• Exclusion Criteria* or • SOFA >11*	Medical Mgmt +/- Palliate & d/c
Red	• SOFA ≤7 or • Single Organ Failure	Highest
Yellow	• SOFA 8-11	Intermediate
Green	• No significant organ failure	Refer or d/c, reassess as needed

*If exclusion criteria or SOFA >11 occurs at any time from the initial assessment to 48 hours, change triage code to Blue and palliate.

d/c = discharge

Critical Care Triage Tool (48-Hour Assessment)		
Color Code	Criteria	Priority/Action
Blue	• Exclusion Criteria or • SOFA >11 or • SOFA 8-11 no Δ	Palliate & d/c from CC
Red	• SOFA <11 and decreasing	Highest
Yellow	• SOFA <8 no Δ	Intermediate
Green	• No longer ventilator dependent	d/c from CC

Glasgow Coma Scores will not be calculated at 48 and 120 hours if the patient must be awakened to do so unless the score could move the patient into another category.

Δ = change
CC = critical care
d/c = discharge

Critical Care Triage Tool (120-Hour Assessment)		
Color Code	Criteria	Priority/Action
Blue	• Exclusion Criteria* **or** • SOFA >11* • SOFA <8 no Δ	Palliate & d/c from CC
Red	• SOFA score <11 and decreasing progressively	Highest
Yellow	• SOFA <8 minimal decrease (<3-point decrease in past 72h)	Intermediate
Green	• No longer ventilator dependent	d/c from CC

Glasgow Coma Scores will not be calculated at 48 and 120 hours if the patient must be awakened to do so unless the score could move the patient into another category.

*If exclusion criteria or SOFA >11 occurs at anytime from 48-120 hours, change triage code to Blue and palliate.

CC = critical care
d/c = discharge

Appendix 4

Pandemic Influenza Triage Criteria

(Patients meeting one of these criteria should be referred for further evaluation)

1. Presence of pulmonary symptoms and one of the following comorbid conditions:
   a. Renal failure
   b. Chronic obstructive pulmonary disease/Asthma/Bronchopulmonary dysplasia
   c. Malignancy
   d. Diabetes
   e. Congestive heart failure/Congenital heart disease
   f. Chronic liver disease
   g. Alcohol abuse
   h. Malnutrition
   i. Cerebral vascular accident/Chronic seizure disorder
   j. History of transplantation/Immunosuppression
2. Physical Findings
   a. Respiratory rate >30
   b. Hypotension (systolic BP <90, diastolic BP <60)
   c. Pulse >125
   d. Decreased level of consciousness
   e. For children, use Pediatric Advanced Life Support (PALS) respiratory and heart rate standards*
3. Laboratory values
   a. Pulse oximeter O_2 saturation <92

*PALS guidelines for children:

Respiratory rate:

4 kg.-19 kg. >60
20 kg.-24 kg. >35
>25 kg.-adult guidelines

Pulse:

4 kg.-9 kg. >160
10 kg.-13 kg. >140
>14 kg.-adult guidelines

Hypotension systolic <70 + (2 X age in years)

Appendix 5

Name_____
MR#_____

Pandemic Influenza Flow Sheet

Date																							
SOFA																							
Initials																							
Time																							
Temp																							
Initials																							

Oxygen Saturation

Date																							
Time																							
O_2Conc																							
Initials																							
100																							
99																							
98																							
97																							
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85																							
84																							
83																							

Was patient treated with anti-influenza medication? Yes ☐ No ☐ Date started:_____
Did patient require oxygen? Yes ☐ No ☐ Date started:_____
Did patient require noninvasive ventilation? Yes ☐ No ☐ Date started:_____
Did patient require invasive mechanical ventilation? Yes ☐ No ☐ Date started:_____
Final Outcome: Alive ☐ Dead ☐

Appendix 6

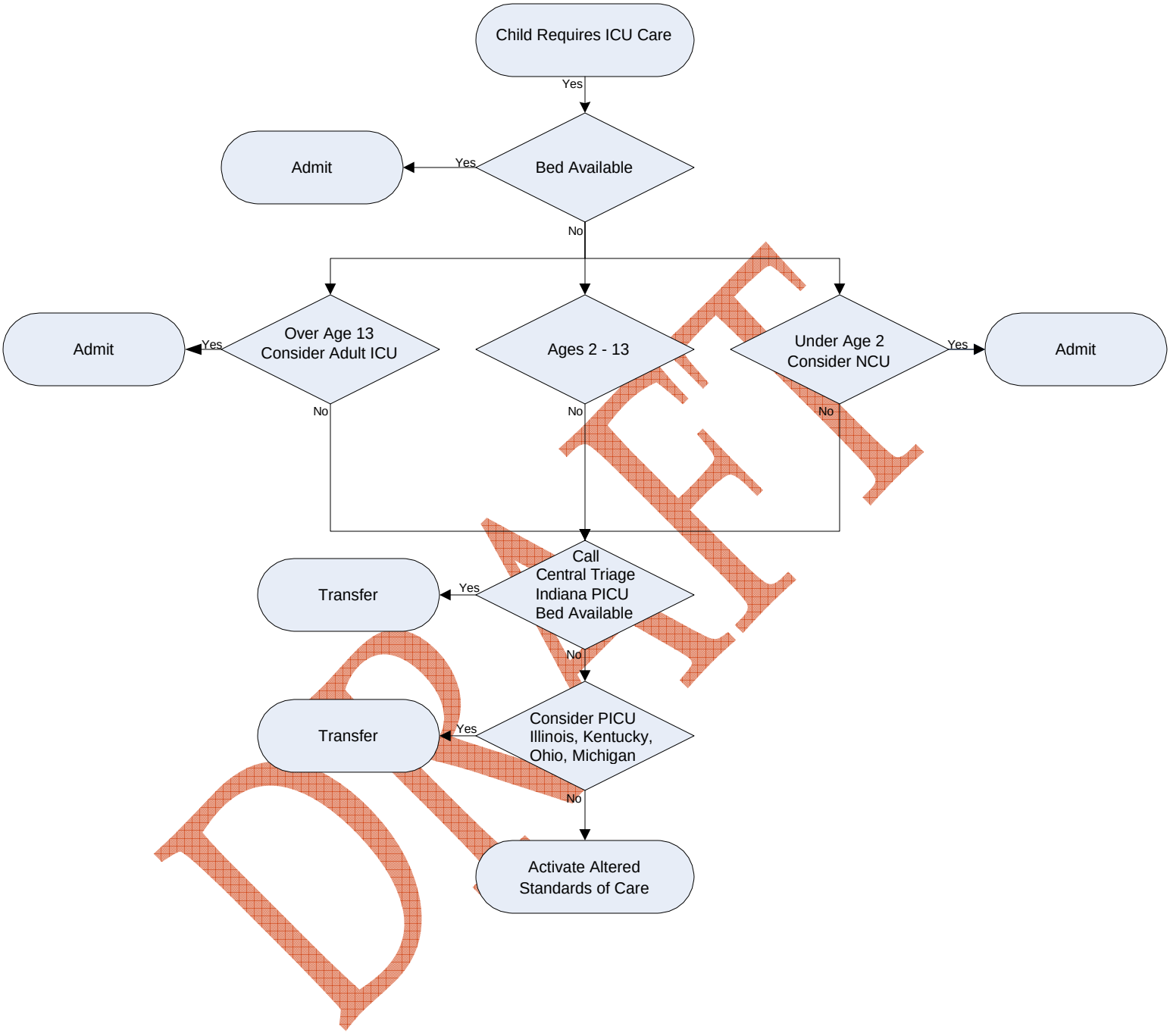
Suspected Pandemic Influenza Admission Orders

1. Admit to: _____
2. MD/DO/NP: _____
3. Diagnosis: _____
4. Condition: _____
5. Allergies: _____
6. Vital Signs (including temperature) q 8 hours. Record on flow sheet.
7. Ins and Outs q shift.
8. Laboratory studies on admission:
   a. CBC with differential
   b. BMP
   c. ABG
   d. Multiple oropharyngeal swabs for influenza RT-PCR testing on different days and different times of day (to be sent to Indiana State Department of Health [ISDH] Laboratories if not available in hospital). Prior authorization number is required to send specimens to ISDH Laboratory before testing will be performed. Call the ISDH after-hours line, 317.233.1325, or the Surveillance and Investigation Division to obtain the authorization number. Other acceptable specimens would include bronchoalveolar lavage fluid, endotracheal aspirate, pleural fluid, sputum or nasal swab.
   e. Acute and convalescent serum specimens. Acute collected within 1 week of symptom onset and convalescent collected 2-4 weeks after symptom onset. Blood in red top tube for influenza antibody testing (to be sent to ISDH if authorized and not available in hospital).
   f. Nasal swab for influenza antigen testing (to be sent to local health department [LHD] if not available in hospital).
   g. Blood in red top tube for influenza antibody testing (to be sent to LHD if not available in hospital).
   h. Red top tube for serum storage
9. CXR PA and lateral/portable (circle one) on admission.
10. O2 saturation by oximetry q 4 hours. Record on flow sheet.
11. Apply supplemental O2 by nasal cannula as necessary to maintain O2 saturation greater than 92%.

12. If unable to maintain oxygen saturation greater than 92% on 6 liters via nasal cannula (or 44% face mask), consider ventilatory support.
    a. BIPAP
        i. Apply enough inspiratory pressure to achieve RR <25 and tidal volume >6 ml/kg
        ii. Set expiratory pressure at 5 cmH_2O
        iii. Wear continuously for 6 hr. Can take off for 30-minute periods thereafter to eat and clear sputum.
        iv. Set backup rate of 12 breaths/minute
    b. Indication for intubation and mechanical ventilation
        i. Failure of BIPAP as evidenced by respiratory distress or O2 requirements >12 liters/min.
        ii. Same as for BIPAP if:
            1. BIPAP is not available.
            2. Patient is too somnolent or debilitated to be able to protect his/her airway.
            3. The hospital has chosen to place all patients with respiratory failure directly on mechanical ventilation through an endotracheal tube rather than BIPAP.
            4. Calculation of SOFA score results in ventilator qualification for that day.
13. If patient has admission O2 saturation ≤92% on room air or has infiltrates on admission CXR, begin oseltamivir (Tamiflu) 75 mg P.O. q 12 hours. This should be started within the first 24 hours after admission.
14. Medications:
    a. Tylenol 650 mg PO q 6 hours prn temp >100.0 F
    b. _____
    c. _____
    d. _____
    e. _____
    f. _____
    g. _____
    h. _____
    i. _____
    j. _____
    k. _____
    l. _____
    m. _____

Appendix 7

Pediatric Bed Assignment



Appendix 8

Potential Use of Noninvasive Positive Pressure Ventilation (BIPAP) in the Setting of Pandemic Influenza

Homer L. Twigg III, M.D.
Division of Pulmonary and Critical Care
Indiana University Medical Center

Potential advantages of using BIPAP:

1. Less expensive
   a. BIPAP machine $3,500-$4,000
   b. Portable ventilator $5,000-$12,000
   c. Regular ventilator $20,000-$30,000
2. Potential usage during times when influenza risk small
3. Less patient morbidity for responders
4. More rapid ICU throughput
5. Less need for sedating drugs
6. Better nutrition
7. Can use with endotracheal tube, though this leads to loss of some of the benefits above

Potential disadvantages of using BIPAP:

1. Greater risk of health care worker exposure because patient expiration is unfiltered
2. Greater need for patient monitoring
3. Less options for patient support

Equipment necessary for using BIPAP:

1. BIPAP machine
   a. Must have backup rate
   b. Must be able to bleed in oxygen
   c. Capable of providing up to 30 cmH2O inspiratory pressure
2. Facial mask, NOT nasal mask
3. Non-jet outflow device
4. Viral-bacterial filter before exhalation device

Room requirements for using BIPAP:

1. Isolation rooms vs 4-6 bed cubicles on the ward
2. Must have exhaust ventilation creating negative pressure airflow to the outside
3. 12 air exchanges per hour

Indications for using BIPAP:

1. Oxygen saturation <93% on 6 liters/min (roughly 44% FiO2) oxygen via nasal cannula or face mask
2. Not somnolent

Application of BIPAP:

1. Goals
   a. RR <25
   b. TV >6 ml/kg
2. Wear continuously for 6 hr. Can take off for 30-minute periods thereafter to eat and clear sputum
3. Backup rate of 12 breaths/minute
4. Indication for intubation
   a. Respiratory distress
   b. O2 requirements >12 liters/min
5. After 24 hours, success could be predicted by:
   a. Decreased respiratory rate
   b. Less severe disease on chest x-ray

Health care worker protection when caring for patients on BIPAP:

1. This is a major concern with noninvasive ventilation.
2. Equipment recommended:
   a. Full gown
   b. Shoe covers
   c. Gloves
   d. HEPA-based air purifying respiratory system (hood)

Experience of using BIPAP in Severe Acute Respiratory Syndrome (SARS):

1. About 20-25% of subjects with disease required ventilation
2. Noninvasive ventilation was successful in preventing intubation in 70%
3. Average time on BIPAP: 3½ days
4. Less ICU stay in responders (3 days) versus nonresponders (21 days)

Notes:

1. All patients with noninvasive ventilators at home (CPAP or BIPAP) should bring their equipment to the hospital should they seek medical attention. While CPAP may be tried initially in patients requiring respiratory assistance who have their own CPAP device, should they fail, BIPAP can be attempted. In patients who do not have a home CPAP machine, BIPAP is the preferred non-invasive ventilator support mode.
2. Disposable equipment needs similar between noninvasive ventilation and conventional ventilation. Both need tubing, exhalation filters. Need face mask for BIPAP versus endotracheal tube for conventional ventilation.
3. Both modes of ventilation require compressed gas and oxygen.

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Appendix 9

Altered Standards of Care Community Advisory Group

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